UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

REPLY TO THE ATTENTION OF:
SR-6J

March 8, 2019

Mr. Naren Prasad
WEC Energy Group
200 East Randolph Drive, 21st Floor
Chicago, IL 60601

Re: Review of the Remedial Investigation Report, North Branch of the Chicago River Willow Street Station, Division Street Station and North Station, Operable Unit 2, Chicago, Illinois

Dear Mr. Prasad:

The U.S. Environmental Protection Agency (U.S. EPA) has reviewed the document entitled: *Remedial Investigation Report (RI)* for the North Branch of the Chicago River Willow Street Station, Division Street Station and North Station, Operable Unit 2, dated August 22, 2018. Comments provided below include suggestions and clarifications on the report (both general comments for the entire report and comments on specific sections and appendices).

General Comments:

1. The RI Report does not address screening of upland operable unit 1 (OU1) groundwater contaminant concentrations against the Chicago CAWS surface water criteria. While such screening may seem to be a topic for the upland OU1 RI reports/revisions, the potential for groundwater to surface water interface (GSI) requires that both the upland and river operable units consider potential GSI. This RI report addresses surface water sampling results and related risks but does not mention or consider the potential contribution and risks associated with GSI. The evaluation of current and future OU2 surface water risks, including potential impacts migrating from the OU1 upland sites, could be substantially improved and made more complete if screening of upland groundwater contaminant concentrations against the Chicago CAWS surface water criteria were included in the OU2 report. For example, if the groundwater data from one or more of the 3 upland MGP sites associated with OU2 was screened against CAWS and was found to be below CAWS screening criteria, the potential for GSI from one or more of these OU1 MGP sites to the river OU2 could be eliminated in the OU2 RI report per the GSI decision flowchart. If there are exceedances of the CAWS criteria in upland groundwater at one or more of the three MGP sites, the potential for GSI investigations can be properly integrated into either the upland or river RI/FS process, as appropriate.

Additionally, CSM Figures 24a and 24c in the OU2 RI report include note "POTENTIAL GROUNDWATER EXCEEDS SCREENING LEVELS", but Section 5.4 of the OU2 RI report does not discuss these groundwater screening exceedances or potential GSI. Section 5.4 only discusses the lack of apparent DNAPL MGP residual mobility but ignores potential GSI. Please plan to include CAWS screening and GSI matrix evaluations in the upland OU1 RI reports/revisions, as well as the OU2 RI revision. The OU2 RI revision can include a general discussion of the CAWS screening and reference the OU1 RI reports as necessary.

2. EPA recently provided comments on the BLRA for additional MGP sites located in the City of Chicago, indicating that there was difficulty in evaluating the BLRA data tables since they were not presented in a conducive format to verification. Similarly, there was difficulty in reviewing the BLRA presented in this report. While the sediment and surface water HHRA appears to follow the guidance set forth in the RAF Workplan (2007) and Addendum 6 (2017), and the HHRA text outlines all the elements generally presented in a traditional RAGS HHRA, verifying that the data was used appropriately, and the calculations are correct is difficult using the presentation provided. While it is understood that the standard RAGS D format will not work for the risk ratio approach used for this risk assessment, some elements from the more traditional RAGS D reporting format should be presented. These elements include:

    - A list of the sample locations used in the HHRA should be included in the HHRA or at least a reference to a suitable table in the RI should be provided. Currently the sample locations in the QC files have been checked against Table 2 in the RI and it appears the sample list in Table 11a is the same for Division Street with few exceptions. For example, location STA-71DSS was included in the dataset but this location does not appear in Table 2 and STA-71DSS appears to be a mobility study sample which does not seem appropriate for inclusion in the HHRA dataset. Please provide an explanation for including chemistry data for the mobility samples in the HHRA. Although analytical data was collected for mobility locations STA-8DSS-MOBILITY, STA-19DSS-MOBILITY, STA-22DSS-MOBILITY, STA-45DSS-MOBILITY, and STA-71DSS-MOBILITY, it is unclear how the chemistry data for the remaining samples were addressed. Please include a sample table in the HHRA and a discussion of the rationale for including samples not typically used in an HHRA.
    - A figure that shows the sample locations used in the HHRA. While this is easy to determine for surface water because there are fewer surface water samples collected, the sheer number of sediment samples and the different types of sediment samples collected (including mobility study and geotechnical samples) makes it difficult to use the RI tables and figures for the HHRA. For the North Branch Chicago River Site, this could possibly be accomplished by providing notes on the RI figures indicating which samples were not included in the HHRA data set.
    - The QC tables are password protected making it impossible to manipulate the data in the QC tables to filter, open, and close columns so that the information regarding sample IDs can be seen. As a result, the end user is forced to copy and paste the tables into a new file to see and manipulate the data. For future

submittals, an unprotected version of the tables should be provided. Formulas are not necessary, but the end user should be able to adjust the column widths and filter the data without having to create new files. Additionally, providing the data as numbers or at least in general format would also be useful. The numbers in the tables are currently presented as text.

3. The report includes discussion in various sections on the depth NAPL is encountered, sediment stability, and USACE federally authorized dredge depths. Please modify the report to include a discussion on the elevation of DNAPL deposits in comparison to authorized dredge channels. Additionally, a figure might be needed to aid in the discussion.

Specific Comments:

4. Section 4.6.1.2 includes a statement that "The spatial variation within the OU2s, and observed exceedances located upstream of the upland OU1s, suggests that PVOCs found within the OU2s may be representative of ambient conditions." While there are exceedances of both construction worker and ecological screening exceedances located upstream and downstream of the MGP upland OU boundaries, there is a clear zone of more elevated PVOC concentrations immediately adjacent to the upland OU1 boundaries. For instance, there are approximately 16 subsurface sediment samples with benzene concentrations exceeding 5 mg/kg at the Willow Station OU2, and they all occur in the river sediment directly in front of or adjacent to the Willow Street OU1 footprint. This includes one benzene detection of 272 mg/kg at location WSS-RSB017 near the center of the OU1. *None of the detected benzene concentrations exceeding 5 mg/kg were located upstream or downstream of the Willow OU1 boundary.*

   Please note the 5 mg/kg concentration was selected for general comparison purposes because it is the arithmetic mean of the benzene sediment concentrations at the Willow Street OU2. Similar patterns are evident for Division and North Station. Among the approximately 20 subsurface sediment samples that exceed a benzene concentration of 5 mg/kg at Division and North Station, 18 of them are located in the river sediment directly in front of or adjacent to the respective OU1 footprints. Based on this information, there appears to be a clear spatial association of elevated PVOCs exceeding 5 mg/kg with the three OU1 footprints, and the conclusions of the RI report should be modified accordingly.

   Also note that Table 6 in the RI report shows that there were no subsurface ambient sediment sampling locations that were analyzed for PVOCs (only surface sediment included ambient PVOC analysis). Therefore, there is no ambient sediment data for subsurface PVOCs to compare against the Willow subsurface sediment results for PVOCs in order to support the statement referenced above. Section 4.4.1.4 also states that "PVOCs are reported to have a correlation greater than 0.8 with TPAH results, indicating that PVOCs are coincident with TPAHs and decline as PAHs decline." Since there is oil-wetted MGP residual documented in proximity to the MGP footprints (which would be expected to have elevated TPAH values), it would also follow that these sediments would be expected to have elevated PVOC concentrations. Please re-evaluate these PVOC results and provide clarification of the cited statements.

5. Section 5.2 states that "Based on the results of an ambient sediment investigation conducted on the River, and a similar study completed in the South Branch of the Chicago River, it was determined that exceedances of the CAWS are unrelated to former MGP operations". There is evidence of ambient impacts in surface water data suggesting that select PAH and metals impacts exceeding the CAWS criteria are present throughout the river. However, the Table 8 surface water results were further reviewed with a focus on benzo(a)pyrene (BaP) and benzo(a)anthracene (BaA) concentrations, and an evaluation of the reported concentrations for the ambient-designated samples listed in Table 2 of the RI report including SWA-2DVS, SWA-1DVS, SWA-4DVS/4WHS, SWA-1DVS/1WHS, SWA-2DVS, SWA-4DVS, SWA-3DVS, SWA-3DVS/3WHS, SWA-3DVS, SWA-2DVS/2WHS, SWA-4DVS, and SWA-1DVS. When the BaP surface water results are sorted according to concentration, 13 of the 15 highest BaP concentrations are found in water samples that are not associated with the ambient surface water samples listed in Table 2 and appear to be associated with OU2 locations adjacent to the MGP sites. Furthermore, an evaluation of the BaA surface water results indicates that the 8 highest BaA concentrations that exceed the RAF-selected ecological screening level of 0.025 are not associated with the ambient surface water samples listed in Table 2. As noted in Section 4.6.2, "Where benzo(a)anthracene ecological SL exceedances were reported, an exceedance of benzo(a)pyrene SL was also reported indicating a relationship between the two". Therefore, there would appear to be a general association of the more elevated BaP and BaA concentrations with surface water samples collected in proximity to the MGP OU2 locations. This information would appear to conflict with the statement in Section 5.2, as well as the statement in Section 5.2.3.2 in reference to BaP and BaA concentrations which states that "The concentrations of these COPCs in the OU2 areas were similar to ambient conditions, and so none of these COPCs are considered COCs". Please re-evaluate these surface water results and provide clarification of the cited statements, including the overall potential risks posed to surface water by the MGP sites.

6. Section 5.2.3.1 identifies 14 "subsurface sediment samples estimated to pose a potential ecological concern to benthic invertebrates, due to their BTEX (benzene, toluene, ethylbenzene, and xylenes) concentrations." Therefore, the RI report identifies both BTEX and TPAH as ecological COCs within subsurface sediments at Willow and Division OU2 sites. However, the North Station summary only lists TPAH as an ecological COC. This difference in not listing BTEX as a COC and ecological concern for the North Station OU2 appears to be the result of calculations described in Section 5.3.6.2 of the BLRA using "ESB methodology" and calculating "SUM-TU" values that were less than 1. While this methodology may be appropriate in an isolated site situation, the results of the Willow and Division BLRA evaluations have a bearing. The BLRA for North Station in Section 5.3.6.2 states that "There are numerous exceedances of the ecological sediment screening levels for benzene, ethylbenzene, and xylenes in subsurface sediments of the North Station OU2 area. The average concentrations of these three PVOCs were 4–12 times above the ecological sediment SL." Considering that the North Station site also has 5 samples with elevated BTEX results exceeding 5 mg/kg in proximity to TPAH UTL exceedances (See Comment 4), and that the BLRA clearly states that the average concentrations of these three PVOCs were 4–12 times above the ecological sediment SL at North Station, please consider identifying both BTEX and

TPAH as ecological COCs within subsurface sediments at all three MGP OU2s in order to have consistency among the 3 MGP sites.

7. Section 4 (Page 12) of the BLRA indicates that the same ratio method described above for the residential and industrial scenarios was used with the generic construction worker RSLs to estimate risks to construction workers. Neither residential or industrial worker risk are evaluated for OU2. Please modify sentence to exclude these scenarios.

8. The uncertainty section provided in Section 4.3 of the BLRA correctly indicates that EPA-derived toxicity values are designed to be conservative. However, what is not presented is that inclusion of the TACO Remediation Objectives as viable screening levels may introduce another layer of uncertainty as those numbers have not been updated since 2007. Therefore, for some chemicals where the TACO remediation objectives were used, current toxicity values may not have been incorporated into those numbers. Please address the use of the TACO remediation objectives as screening levels and how they may affect the HHRA.

9. In the BLRA, the hazard index numbers are typically presented as 0. The text discusses the completion of a cumulative evaluation for all detected chemicals for which there is a screening level but does not follow through by presenting the risk and hazard ratios for all chemicals where a ratio can be calculated. This information should be included in the BLRA Tables 2a – 13a so that chemicals which do not significantly contribute risk and hazard can be identified. Additionally, after converting the text to numbers, the summed values are often different than the NoncancerHazardSum presented in the tables and the text. Some of this may be because of rounding, but it may be because the values entered for some chemicals are not zero but 0.1 or not all the chemicals detected and included in the cumulative evaluation are included in the cumulative value presentation. An example of this is Table 11a, where the NoncancerHazardSum is 20, but once recalculated to incorporate all values for which a hazard can be calculated, it is 28 which is equivalent to the sum of the values in cells Z10 to BI10. Please review Tables 2a-13a and update accordingly.

10. In Table 11a of the BLRA, it appears that the NoncancerHazardSum value is 20 (or 28) but no target organ analysis was completed. Please include the analysis or provide an explanation for why it was not.

11. Section 4 (Paragraph 2) of the BLRA indicates that residential and industrial scenarios were used with the generic construction worker RSLs to estimate risks to construction workers. The conceptual site model presented in Figure 1 indicates that residential and industrial worker risks were not evaluated for OU2. Please modify Section 4 accordingly.

12. The max concentration NoncancerHazardSum is presented in BLRA Table 10a is 1, however the sum of the values in columns AA32-BK32 is 1.8 (rounded to 2). Please verify that the NoncancerHazardSums presented in rows 32, 33, and 34 are correct and adjust as needed. If the NoncancerHazardSum is indeed greater than 1, then a target organ assessment is needed.

13. The NoncancerHazardSums for the max concentration, 95% UCL and average concentrations should be reviewed in the BLRA risk tables (Tables 2a-13a) to verify that the totals presented for each concentration type are consistent with the totals for

individual chemicals. The 95% UCL and average concentrations for benzene and benzo(a)pyrene are examples of chemicals where the risk and hazard ratio are slightly off and therefore affects the total cumulative value presented. Please review tables 2a – 13a to verify the correct screening levels were used in the calculations and update accordingly.

14. There are slight differences between the EPCs presented in Table 3b2 and the ProUCL output. For example, the EPC for lead for all sediment at the Division Street OU2, should be based on the average concentration which is 415 mg/kg. This value is consistent with the text in Section 4.2.3.2 and the values in Tables 3b2 should be modified accordingly.

If you wish to discuss any of the above comments, please do not hesitate to contact me.

Sincerely,

Sarah Rolfes
Remedial Project Manager

cc: C. Peters, Illinois EPA